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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,569	03/28/2005	Xinxi Diao	UNT-0001	4495

23413 7590 03/08/2007
CANTOR COLBURN, LLP
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EXAMINER

SAFAIPOUR, BOBBAK

ART UNIT	PAPER NUMBER
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2618

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<p align="center">Office Action Summary</p>	<p>Application No.</p> <p>10/511,569</p>	<p>Applicant(s)</p> <p>DIAO ET AL.</p>	
	<p>Examiner</p> <p>Bobbak Safaipoor</p>	<p>Art Unit</p> <p>2618</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Applicant's Response on 12/13/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 4-7 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application</p> <p>6) <input type="checkbox"/> Other: _____</p> |
|--|---|

DETAILED ACTION

Response to Arguments

Applicant's arguments, see pages 5-8, filed 12/13/2006, with respect to the rejection(s) of claim(s) 1-7 under 35 USC 35 USC § 102(e) and 35 USC 35 USC § 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art reference.

Claims 1-7 are now pending in the application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Johansson et al (US Patent #6,954,644 B2)** in view of **Kingdon et al (WO 00/21326)**

Consider **claim 1**, Johansson et al disclose a repeater, comprising: a cell identifier generator module in a downlink circuit structure of said repeater (col. 3, lines 22 to 47), wherein said cell identifier generator module comprises: a synchronization searching unit for searching for a base station pilot signal (col. 3, lines 48 to 55, col. 6, lines 13 to 19, lines 32 to 46); and a time delay unit for generating a fixed delay according to the searching result from the synchronization searching unit, wherein is a delay between a frame start time of the base station pilot signal and a frame start time of the cell identifier signal is the fixed delay (col. 2, lines 47 to 58; col. 3, lines 4 to 21; col. 6, lines 47 to 65), .

Johansson et al fail to disclose a cell identifier signal generating unit for generating a cell identifier signal.

In related art, Kingdon et al disclose a system and method that makes more efficient utilization of BTS resources when BTSs are employed in TOA measurements. A maximum signaling delay is assumed for which BTS resource assignment is delayed by a default time span in the even of an impending TOA measurement thereby allowing the BTS availment of the resources which would otherwise be idle yet assigned and therefor unavailable for other BTS functions during the period of signaling delay. The period of resource assignment delay may be increased or decreased, the actual adaptation of the delay dependent on the true signaling delay. (abstract, col. 5, lines 18-27)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Kingdon et al into the teachings of Johansson et al to delay the BTS resource allocation in anticipation of signaling delays when making time of arrival measurements.

Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Johansson et al (US Patent #6,954,644 B2)** in view of **Kingdon et al (WO 00/21326)** and in further view of **Cook et al (United States Patent #6,005,884)**.

Consider **claim 2**, and as applied to **claim 1** above, Johansson et al, as modified by Kingdon et al (US Patent 5,649,289), disclose the claimed invention except for the repeater comprises and input end of said cell identifier generator module is connected to a low-noise amplifier module of the repeater, and an output end of said cell identifier generator module is connected to a power amplifier module of the repeater via a coupler.

However, in the same field of endeavor, Cook et al clearly disclose as known in the art a receive path 56 that includes a band pass filter 114 connected to a low noise amplifier 112. The input of the low noise amplifier 112 is connected to the circulator 106. The power amplifier 104 and the low noise amplifier 112 are connected to the output of the voltage regulator 92 via the bias switch 100 (figure 5; col. 21, 30-43).

Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Cook et al into the systems of Johansson et al and Kingdon et al to comprise the principal components of the repeater.

Consider **claim 3**, and **as applied to claim 2 above**, Johansson et al, as modified by Kingdon et al, disclose the claimed invention except for wherein said cell identifier generator module also comprises: a down-conversion unit, an A/D (Analog to Digital) conversion unit, a D/A (Digital to Analog) conversion unit, an up-conversion unit, and a filtering unit; wherein said down-conversion unit is designed to carry out frequency conversion from RF to intermediate frequency for received signals; said A/D conversion unit is designed to carry out sampling and quantification for the intermediate frequency signals; said D/A conversion unit is designed to carry out D/A conversion to obtain a base-band form of the cell identifier signal; said up-conversion unit is designed to carry out conversion from base-band to RF for the cell identifier signal; said filtering unit is designed to carry out band restriction for the cell identifier signal to control frequency leakage to adjacent frequency; said cell identifier signal is coupled to an input end of the power amplifier in the downlink circuit structure of the repeater via said D/A unit, up-conversion unit, and filtering unit.

In the same field of endeavor, Cook et al show and disclose as known in the art a DAC 84 that receives the digital outgoing data from the first communications link 26. In response, the DAC 84 conducts a digital-to-analog conversion operation, thereby generating an analog version of the digital outgoing data. Consequently, the DAC 84 outputs an IF signal of the outgoing data to the up-converter 54. The up-converter 54 shifts the frequency range of the IF signal to the RF range, thereby generating an RF signal of outgoing data. The transmit amplified 62 accepts the RF signal of outgoing data and, in response, generates amplified outgoing data. The transmitted outgoing data is forwarded to the remote terminals 16 within the coverage area 20 of the repeater 18b via the antenna 24 (col. 19, lines 15-28).

Furthermore, Cook et al disclose that the distribution of digital versions of incoming and outgoing data packets on the communications link 26 requires the inclusion within each repeater 18b of an analog-to-digital converter (col. 17, lines 32-27). The frequency converter module 50 can supply an RF signal to the transmit amplifier 62 in response to an IF signal from the signal converter module 80 and an IF signal to the signal converter 80 in response to an RF signal from the receive amplifier 60. The signal converter 80 includes an ADC 82 and a DAC 84, each connected to the first communications link 26, for conducting signal conversion operations (col. 17, lines 45-52).

Cook et al also disclose that the down-converter, which is connected between the first communications link and the receive amplifier, converts the amplified incoming data to an IF signal of the incoming data (col. 5, lines 54-57).

Additionally, Cook et al disclose a low pass filter 108 is connected between the antenna 24 and the circulator 106 where both amplified outgoing data and incoming data are passed via

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the low pass filter 108 to filter undesired out-of-band frequency components (col. 21, lines 58-65).

Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Cook et al into the systems of Johansson et al and Kingdon et al to comprise the principal components of the repeater.

Allowable Subject Matter

Claims 4-7 are allowed.

The following is an Examiner's statement for reasons for allowance.

Consider **claim 4**, the best prior art of record found during the examination of the present application, **Johansson et al (US Patent #6,954,644 B2)** in view of **Kingdon et al (WO 00/21326)** and in further view of **Hua Chen (European Patent Application #1 030 531 A1)**, fail to specifically disclose issuing a cell identifier signal, a fixed delay, and a search window width from the repeater in response to a positioning request from the mobile station, wherein the cell identifier signal is searched in a time range defined by the search window width and the fixed delay; the mobile station measuring a Time Difference of Arrival (TDOA) between the cell identifier signal and a base station pilot signal and reporting the measured TDOA; determining whether the value of TDOA equals to the fixed delay; measuring a Time of Arrival (TOA), TOA_m , from the mobile station to the base station through the repeater; determining a value of TOA_{trans} with the formula: $TOA_{trans} = TOA_m - TOA_c$, wherein the TOA_{trans} means TOA from the mobile station to the repeater, and the TOA_c means a calibrated TOA from the repeater to the

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base station; and calculating the distance between the mobile station and the repeater through multiplying TOA_{trans} with light velocity.

Claims 5-7 are allowable because they are dependent upon claim 1.

Conclusion

Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

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Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Bobbak Safaipoor whose telephone number is (571) 270-1092.

The Examiner can normally be reached on Monday-Friday from 9:00am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

EDAN ORGAD
PRIMARY PATENT EXAMINER

Bobbak Safaipour
B.S./bs

file argu 3/5/07

March 5, 2007